TP-99102
Rev 01-04

User's Manual

TOOLBOX™ SOFTWARE

Diagnostic and On-Screen Service Instructions For:

- Pneumatic ABS (D and E Versions)
- Trailer ABS (Easy-Stop™ and Enhanced Easy-Stop™ with PLC)
- Hydraulic ABS (HABS)
- Hydraulic Power Brake (HPB)
- Electronic Leveling Module (ELM) for Tractors
- Electronic Leveling Module (ELM) for Trailers

MERITOR WABCO

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Introduction

Meritor WABCO TOOLBOX™ Software is a PC-based diagnostics program that runs in Windows® 98, Me, NT, 2000 or XP①. TOOLBOX™ Software provides PC diagnostic capabilities for Meritor WABCO tractor and trailer pneumatic ABS, hydraulic ABS and the electronic leveling module (ELM) for both tractor and trailer. The program provides four basic functions:

- Displays both constant (e.g., ECU number) and changing (e.g., RPMs) information from the system under test.
- Displays both active and stored system faults, as well as the appropriate repair instructions.
- Provides a link to service information testing procedures, etc. (ABS and HABS only)
- Activates system components to verify system integrity, correct component operation and installation wiring.

NOTE: For complete Meritor WABCO maintenance information, refer to the appropriate maintenance manual which is listed in this manual at the beginning of each product section. For copies of Meritor WABCO service literature, contact the ArvinMeritor Customer Service Center at 800-535-5560 or visit our website: meritorwabco.com

① Early versions of TOOLBOX™ (Version 4.2 or lower) will run in Windows® 95.

System Requirements

- Pentium-based personal computer
- Microsoft Windows® 98, Me, 2000 or XP①. Internet Explorer version 3.02 or higher must be installed.

  NOTE: You must have Administrator Privileges to install and run TOOLBOX™ Software on Windows® NT.
- 64 MB RAM
- Approximately 10.0 MB hard disk space for each program. 60 MB hard disk space for full install
- CD-ROM drive
- RS232 to SAE J1708 or RS232 to PLC converter cable
- Serial Port. RS232-SAE J1708 interface adapter required
- Meritor WABCO recommends using a mouse with this program

Windows® is a registered trademark of the Microsoft Corporation.

① Windows® versions approved for use with TOOLBOX™ as of 01/04.

Installation

Follow the instructions included with TOOLBOX™ Software to install the program on your computer.

The installation screen offers three types of installations: Typical, Compact and Custom. Select ***Typical*** or ***Compact*** to install tractor, trailer and hydraulic ABS diagnostic programs. Select ***Custom*** to install only one or two of these programs.

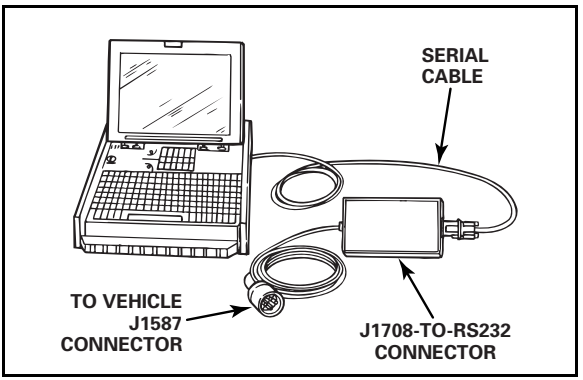
After installation, Meritor WABCO TOOLBOX™ Software will be available on your desktop as an icon and under the Windows® start menu.

Refer to "System Setup" on page 5 for first-time use instructions.

NOTE: An RS232 to J1708 or RS232 to PLC converter box attached to the communications port on your computer (COM1 or COM2) is required. Converter boxes that have been tested and proven satisfactory are Noregon, MPSI, B&B Devices, Kent-Moore and Dearborn Group.

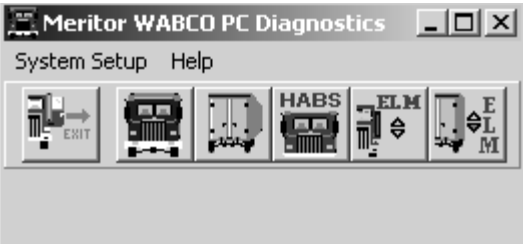
Starting TOOLBOX™ Software

1. Attach the RS232 to J1708 converter cable from your computer's serial port to the converter box.
2. Attach the diagnostic cable (Deutsch) to the vehicle.



At start-up, select the ***TOOLBOX™ Software*** icon from Desktop or from the Windows® Start Menu to display the MAIN MENU.

Main Menu



ABS Menus and Toolbars are illustrated and explained in this manual, as follows:

Tractor ABS	pages 11-21
Trailer ABS	pages 23-36
Hydraulic ABS	pages 37-47
Hydraulic Power Brake (HPB)	pages 48-57
ELM for Tractors	pages 58-62
ELM for Trailers	pages 63-68

Most TOOLBOX™ features are accessible through pull down menus. Many of these features may also be accessed by a shortcut icon. When a shortcut is available, the appropriate icon is illustrated to the left of the copy.

At the ***Main Menu*** you may select a shortcut icon to:

Exit TOOLBOX™

Go to Tractor ABS diagnostics

Go to Trailer ABS diagnostics

Go to Hydraulic ABS (HABS) diagnostics OR Go to Hydraulic Power Brake (HPB) diagnostics

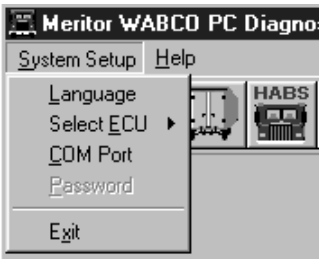
Go to Electronic Leveling Module (ELM) for Tractors

Go to Electronic Leveling Module (ELM) for Trailers

Main Menu

System Setup

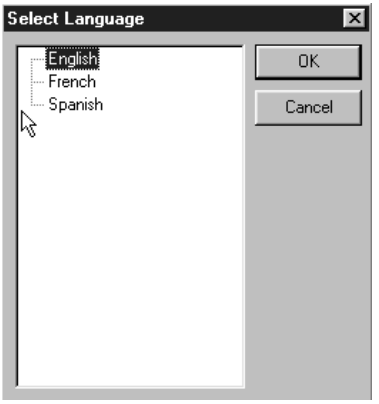
Select ***System Setup*** from the ***Main Menu***.



Language

Select ***Language*** from the ***System Setup*** menu. The default is English. To change the default to French or Spanish (ABS only):

1. Select the appropriate language.
2. Click OK to accept the selection.



Select ECU

Tractor ABS

ELM Tractor

Trailer ABS

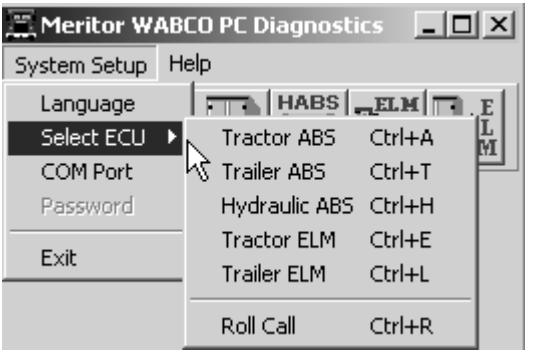
ELM Trailer

Hydraulic ABS/HPB

Click on ***Select ECU*** from the ***System Setup*** menu, then select the type of ABS to be tested. Click on the appropriate Meritor WABCO product icon to display the ***Main Menu*** for that program.

Roll Call displays all actively broadcasting ECUs.

NOTE: TOOLBOX™ diagnostics cover only Meritor WABCO ECUs.



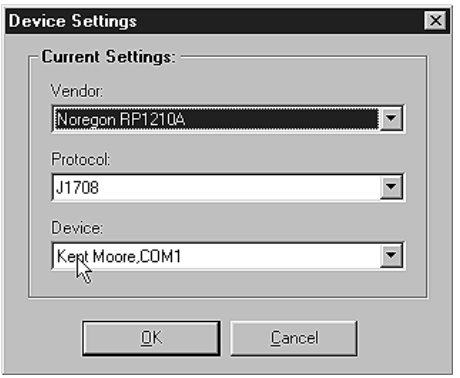
COM Port

Palm Pilot Setup:

- Go to Palm Pilot Setup Menu
- Change COM port to COM port 3
- Reboot PC

The correct ***Vendor***, ***Protocol*** and ***Device*** selections are essential. TOOLBOX™ will not operate correctly if these selections are not accurate. For assistance, contact the ArvinMeritor Customer Service Center at 800-535-5560.

From the ***System Setup*** pull down menu, select ***COM Port*** to display the ***Device Settings*** menu. Current settings will be shown.

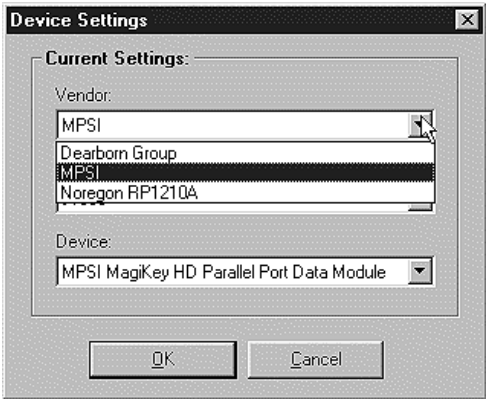


To change these selections:

Vendor

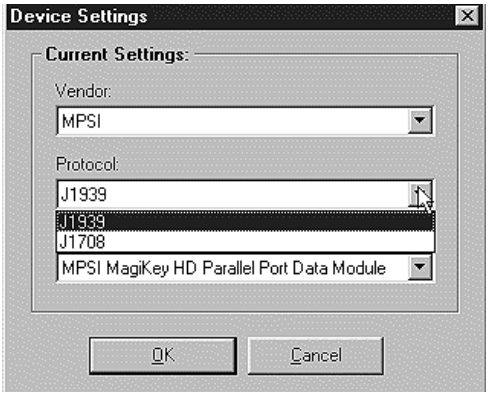
(Vendor name should appear on the parts label on the connector box)

Click on the down arrow for a list of ***vendor*** choices. Select the appropriate vendor.



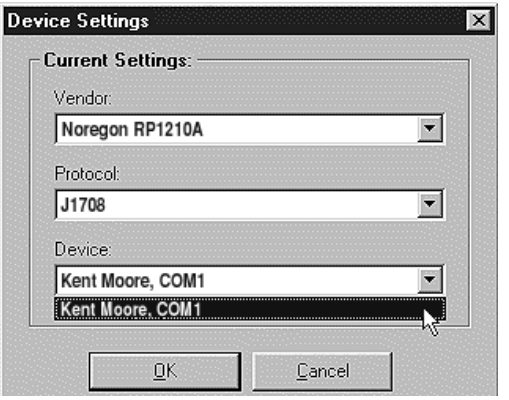
Protocol

Click on the down arrow for the ***protocol*** choices.



Device

Click on the down arrow for the ***device*** choices. Select the device and port to which the data cable is connected.



Click OK to accept the selections and close the ***Device Settings*** window.

Help

Select the ***Help*** icon for help in using Meritor WABCO TOOLBOX™ Software. Help is accessible from all TOOLBOX™ pages. Search by title ***(contents)*** or type in a specific topic ***(search for help on)***.

System Information

Select ***System Information*** and follow the screen prompts to print a report of system hardware: operating system version, drivers, etc. Run this report whenever you contact the ArvinMeritor Customer Service Center.

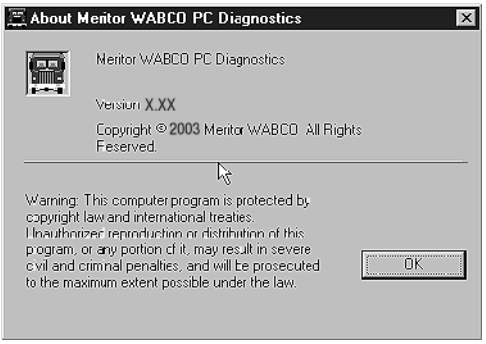
Update Application

(Versions 5.0 and Higher)

Select ***Update Application*** to download future revisions to TOOLBOX™. This option is available for TOOLBOX™ version 5.0 and higher. Follow the screen prompts to complete the download.

About

Select ***About*** from the pull down menu for information about Meritor WABCO TOOLBOX™ Software, including the version number. You may need this information if you call the ArvinMeritor Customer Service Center.

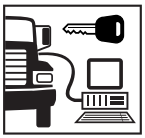

About Meritor WABCO PC Diagnostics
Meritor WABCO PC Diagnostics
Version X.XX
Copyright © 2003 Meritor WABCO All Rights Reserved.
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.
OK

Tractor ABS

Reference Material

For maintenance and repair information, refer to the appropriate Meritor WABCO Truck, Tractor and Bus ABS Maintenance Manual:

MM-30 D Version ABS
MM-0112 E Version ABS

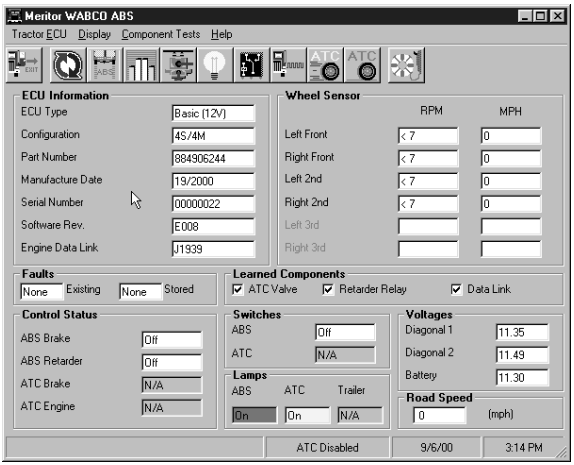


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

TRACTOR ABS MENUS AND TOOLBARS

Select ***Tractor ABS*** from the TOOLBOX™ ***Main Menu***. The Tractor ABS ***Main Screen*** will appear.

Main Screen

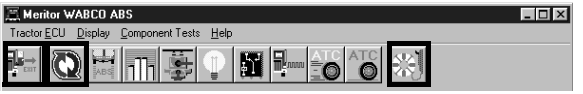


This screen provides icons and pull down menu task selections. It also provides information about the current state of Meritor WABCO ABS. ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, control status, voltages, faults and road speed) is read and updated continuously.

The status of ABS switches and lamps as well as other data may be observed from this screen.

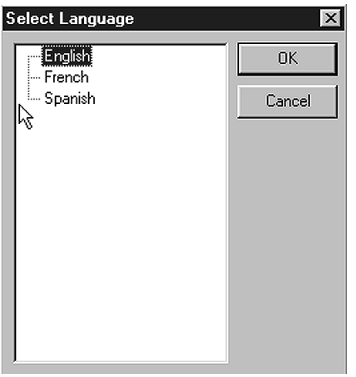
Restart
Exit
Help

From the ***Main Screen*** you can select ***Restart, Exit*** or ***Help***.



Tractor ECU

Select ***Tractor ECU*** from the Tractor ABS ***Main Screen***. A pull down menu will appear.

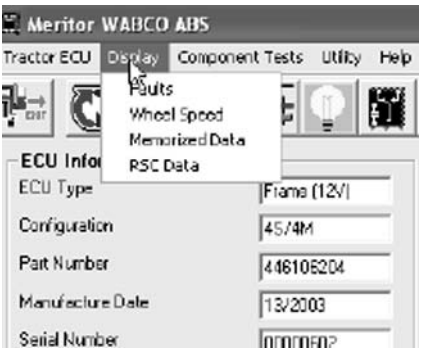


Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

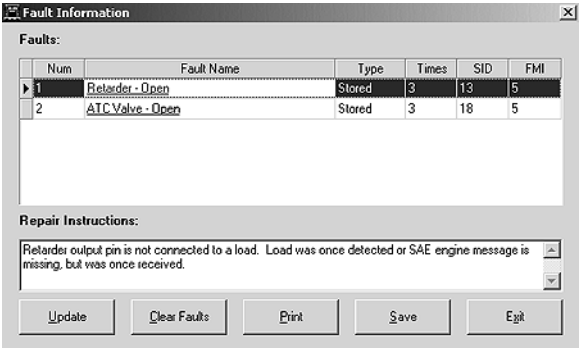
Display

Select ***Display*** from the Tractor ABS ***Main Screen***. A pull down menu will appear.



Faults

Select ***Faults*** from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Basic repair instructions for each fault are also provided.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***update*** button to refresh the fault information table.

After making the necessary repairs, use the ***clear faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

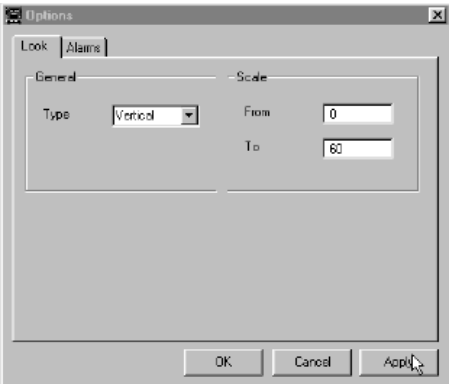
Use the ***Save*** or ***Print*** button to save or print the fault information data.

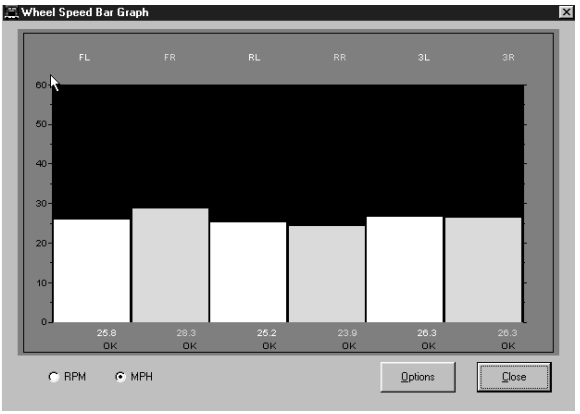
Wheel Speed

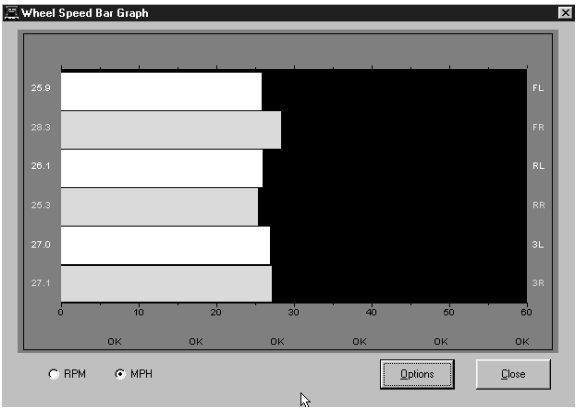
Select ***wheel speed*** from the pull down menu to display wheel speed data in both numeric and graph form.

Wheel speed information may be viewed in RPM (revolutions per minute) or MPH (miles per hour). Select the appearance and style from the ***options*** menu.

Display wheel speed data vertically or horizontally.





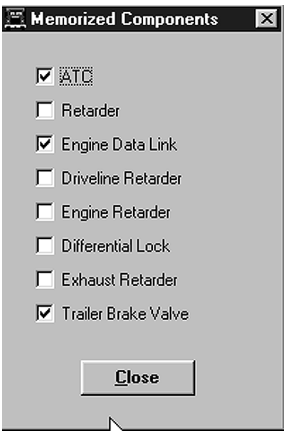


Memorized Data

(E Version ABS Only)

Select ***Memorized Components*** from the pull down menu.

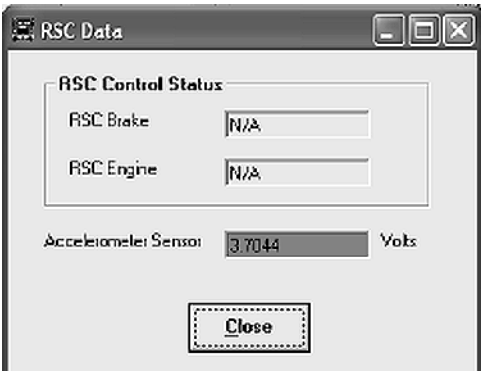
NOTE: Use Display/Memorized Components to view data. To clear a memorized component, use the Memorized Components function that appears on the Component Tests Menu.



RSC Data

(E Version ABS Only)

Select ***RSC Data*** from the pull down menu for RSC status information:



For RSC Control Status:

NA — RSC is not an option

OFF — RSC is installed but is not currently active

For Accelerometer sensor:

Acceptable range is 2.21-2.78 volts

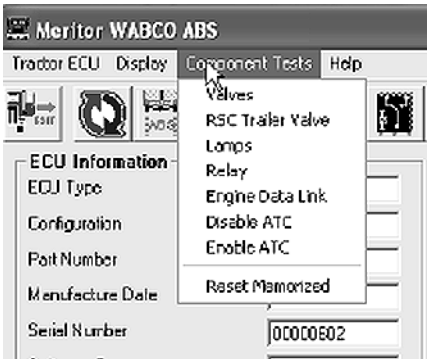
A **red** background in this field indicates voltage is outside of the acceptable range.

A **green** background in this field indicates voltage is within the acceptable range.

Component Tests

Select ***Component Tests*** from the Tractor ***ABS Main Screen***. A pull down menu will appear.

NOTE: Components for test may also be selected from the icons on the Tractor ABS Main Screen.

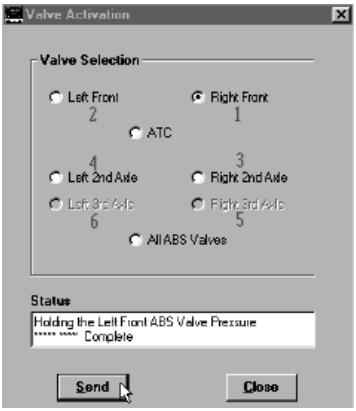


Valves

Select ***Valves*** from the pull down menu to select and cycle individual ABS modulator valves. Then, listen to ensure the correct valve is cycling. This is also helpful in verifying correct operation, installation and wiring.

Select ***all valves*** from the menu to cycle all available ABS valves in the order shown below.

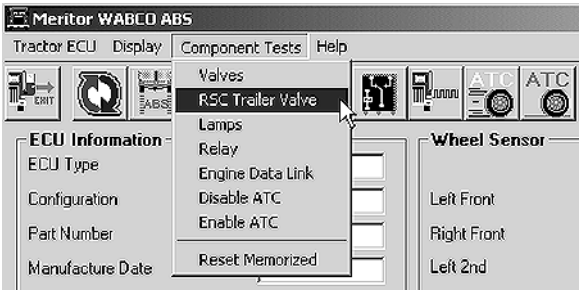
NOTE: Verification of the ATC valve is also available from this menu.



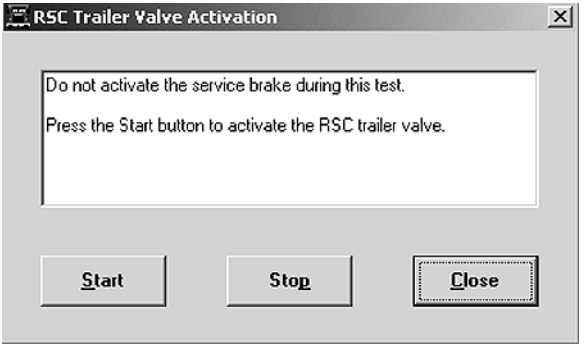
RSC Trailer Valve

(E Version ABS Only)

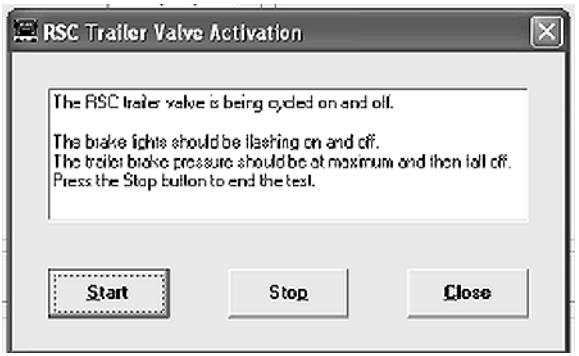
Select ***RSC Trailer Valve*** from the pull down menu to cycle the RSC trailer valve.



NOTE: Do not activate the service brake while testing the RSC trailer valve.

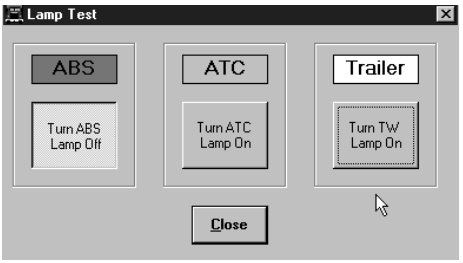

RSC Trailer Valve Activation
Do not activate the service brake during this test.
Press the Start button to activate the RSC trailer valve.
Start
Stop
Close

Press ***Start*** to begin the test.


RSC Trailer Valve Activation
The RSC trailer valve is being cycled on and off.
The brake lights should be flashing on and off.
The trailer brake pressure should be at maximum and then fall off.
Press the Stop button to end the test.
Start
Stop
Close

Lamps

Select ***Lamps*** from the pull down menu to turn the tractor ABS, trailer ABS or ATC (wheel spin) indicator lamps on or off.



This is helpful in verifying correct operation, installation and wiring of the lamps to the ECU.

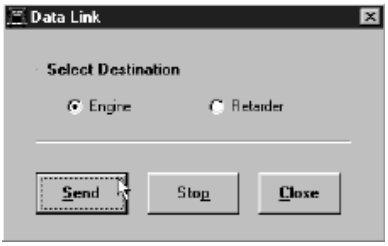
Relay

Select ***Relay*** from the pull down menu to turn the Retarder Relay on or off.

This is helpful in verifying correct operation, installation and wiring of the unit under test.

Engine Data Link

Select ***Engine Data Link*** from the pull down menu to send a "limit engine torque" command to the engine or a "disable retarder" command to the retarder.



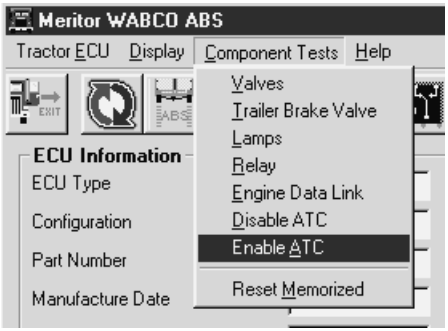
Disable ATC

Select ***Disable ATC*** from the pull down menu to send a command to the ECU to disable automatic traction control. ATC will remain disabled until the enable command is sent or the vehicle ignition is cycled. The status bar on the Main Screen reflects the current state of the ATC function, either Enabled, Disabled or N/A (not available).

Using the **Disable ATC** command is useful and essential for dynamometer testing.

Enable ATC

Select ***Enable ATC*** from the pull down menu to send a command to the ECU to enable automatic traction control. This is the normal state of the ECU. The status bar on the Main Screen reflects the current state of the ATC function, either Enabled, Disabled or N/A (not available).



Reset Memorized

Select ***Reset Memorized*** from the pull down menu to tell the ECU to reset the memorized or “learned” components.

The ECU has the ability to learn the following components: ATC valve, engine data link and retarder relay. Once any of these have been detected, the ECU expects to see them each time the ECU is powered on. If they are not seen, the ECU records a fault.

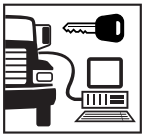
Because there are times when an ECU is moved to another vehicle — or during diagnostic testing — you may want the ECU to disregard these learned components. Use the ***Reset Memorized*** command for this purpose.

Trailer ABS

Reference Material

For maintenance and repair information, refer to the appropriate Meritor WABCO Trailer ABS Maintenance Manual:

MM-33	Easy-Stop™ Trailer ABS
MM-0180	Enhanced Easy-Stop™ with PLC Trailer ABS

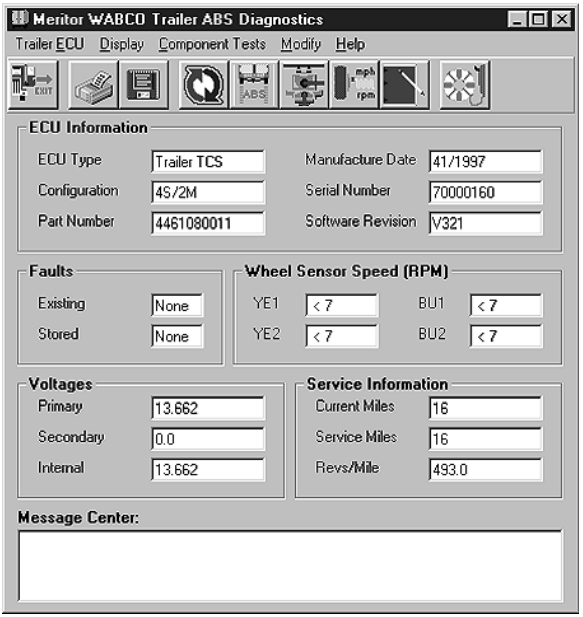


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

TRAILER ABS MENUS AND TOOLBARS

Select ***Trailer ABS*** from the TOOLBOX™ ***Main Menu***. The Trailer ABS ***Main Screen*** will appear.

Main Screen



This screen provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO ABS.

ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

NOTE: Double click on Yes in the Existing or Stored Faults fields to bring up the Fault Information screen. This screen is illustrated on page 40.

Service Information may also be observed from the Trailer ABS main screen.

Restart
Exit
Help

From the ***Main Screen***, you can select ***Restart, Exit*** or ***Help***.

Trailer ECU

Select ***Trailer ECU*** from the Trailer ABS ***MAIN SCREEN***. A pull down menu will appear.

Language
Restart

Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

Manual Setup

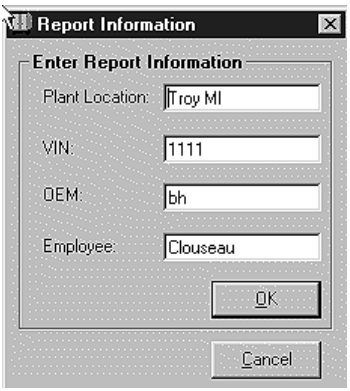
The ***Manual Setup*** menu selection is not available.

Print

To print vehicle data in a report format.

1. From the Trailer ECU pull down menu, select ***Print***. The ***Report Information Screen*** will appear.
2. Enter the VIN and Employee number for the report you want to print.
3. Click OK to print and close the window.

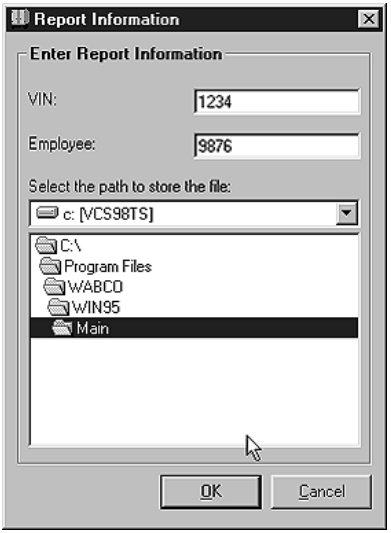
NOTE: Selecting the ***Print*** function does not save report data. You must save all data according to the instructions given in Save, above.



Save

To save vehicle data in a report format:

1. From the Trailer ECU pull down menu, select ***Save***. The ***Report Information Screen with path selections*** will appear.
2. Enter the VIN and Employee number.
3. Select the file where vehicle reports are stored; e.g., Main.
4. Click OK to close the window.



NOTE: Trailer ABS reports are not displayed in TOOLBOX™. To view a report, use Windows Explorer to find and open the report file. The following is a sample report.

Meritor WABCO ABS Fault Report

Date:	September 13, 2000
Time:	5:25 PM
Page:	1
VIN:	12345678
Employee Information:	KILEY
ABS System Configuration:	4S/2M
ECU Revision:	V 3 2 2xxxx
Part Number:	446-108-000-1
Serial Number:	5 9 3 0 3 9 4 8xxxxxxxxx
Date of Manufacture:	13/1999
Current Miles:	0.0
Service Miles:	0.0
Tire Calibration:	495.0

Fault#	Description	Status	SID	FMI	Count
1	Ext. modulator BLUE open circuit detected	Active	9	5	1
2	Ext. modulator BLUE open circuit detected	Stored	9	5	1

Sensor Test Results:

Sensor	Max RPM	Order
YE1	40.0	1
YE2	59.0	2
BU1	50.0	3
BU2	38.0	4

Valve Tests Performed:

Valve	Status (Tested / Not Tested / NA)
Yellow	Tested
Blue	Tested
Red	N/A

Display

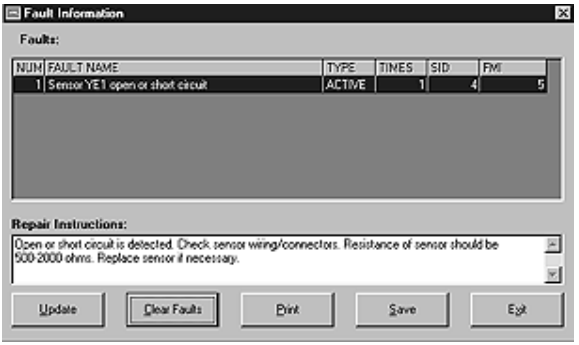
Select ***Display*** from the Trailer ABS ***Main Screen***. A pull down menu will appear.

Faults

Select ***Faults*** to display the Fault Information Screen.

NOTE: The Fault Information Screen is also accessible from the Trailer ABS ***Main Screen***. Refer to page 23.

Fault Information



The ***Fault Information Screen*** contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

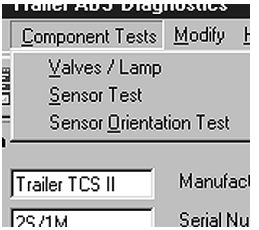
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for complete information about Save and Print functions.

Component Tests

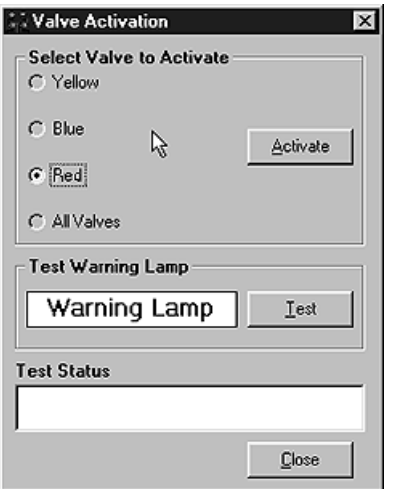
Select ***Component Tests*** from the Trailer ABS ***Main Screen***. A pull down menu will appear.



NOTE: Sensor Orientation Test option is only available with TCSII (Enhanced Easy-Stop™) ECUs. It will not appear as a menu choice for Easy-Stop™ ECUs.

Valve and Lamp Activation

Select ***Valves/Lamp*** to display the ***Valve Activation*** screen. From this screen you can check the status of the trailer ABS valves and the ABS indicator lamp mounted on the trailer.



Valves

2S/1M Systems

S = Sensors
M = Modulator Valves

The ***Red*** valve indicator will be selected. Click on the ***Activate*** button and listen for the valve to click, indicating a good installation.

2S/2M, 4S/2M and 4S/3M Systems

The ***Yellow*** valve indicator will be selected. Click on the ***Activate*** button and listen for the valve to click, indicating a good installation. Repeat for the ***Blue*** valve.

NOTE: Selecting ***All Valves*** will sequence all of the valves, beginning with the Yellow valve.

As each valve is cycled, the ***Test Status*** box at the bottom of the screen will display the status of the test.

Lamp

Click on the ***Warning Lamp Test*** button on the bottom of the valve and lamp activation screen to activate the lamp that is mounted on the side of the trailer. The lamp will flash eight times, indicating the lamp is OK. The test status box at the bottom of the menu will display the status.

Message	Status
Complete	OK
Critical Error	Communication error (If this message occurs, check the cable connections, recycle power.)

Sensors

This test requires rotating the vehicle wheels. Refer to the maintenance manual to make sure the vehicle is correctly prepared for this test. Follow all of the warnings and cautions printed in the manual.

Select ***Sensor Test*** to display the ***Sensor Test*** screen.

WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

The ABS is an electrical system. When you work on the ABS, take the same precautions that you must take with any electrical system to avoid serious personal injury. As with any electrical system, the danger of electrical shock or sparks exists that can ignite flammable substances. You must always disconnect the battery ground cable before working on the electrical system.

1. Make sure sensed wheel ends are off of the ground.
2. Apply air to the emergency line to fill the air tanks and release the spring brakes so that the wheels can be rotated.
3. Apply 12 volts DC to the ABS.
4. Click on the ***Start*** button on the ***Sensor Test*** screen to start the test.
5. Rotate the sensed wheel ends at a rate of 1/2 revolution per second. This rate equals a wheel speed of approximately 4 mph (7 kph).
6. Check the screen for sensor output: If Sensor Output is displayed, the sensor test is complete. If there is no Sensor Output, verify tone ring installation and sensor placement (sensor must be pushed all the way in against the tone ring). Refer to the maintenance manual for complete information.

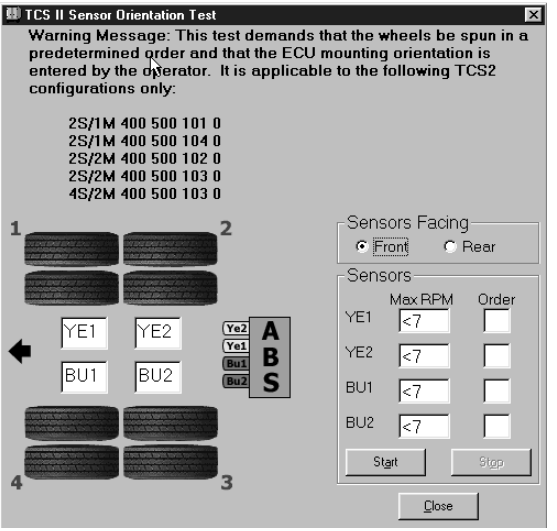
7. Check the ***Order*** fields to verify sensors were installed in the right location, based on the orientation of the valves.

Sensor Orientation Test

(For Enhanced Easy-Stop™ Only)

If you are using TOOLBOX™ to test an Enhanced Easy-Stop™ system, you can check sensor installation by performing a sensor orientation test.

Select ***Sensor Orientation Test*** from the pull down menu. The ***Sensor Orientation Test*** screen will appear.



This test requires that the sensed wheels be spun in a predetermined order and that you enter the ECU mounting orientation. The sensed wheels are rotated in turn, starting at the front curbside, moving to the rear, and ending at the front roadside.

- A correct sensor installation will be displayed in green (Pass).
- An incorrect installation will be displayed in red (Fail).

The results of the sensor orientation test will also appear on the test page printout.

Modify

Select Modify from the Trailer ABS ***Main Menu***. A pull down menu will appear.

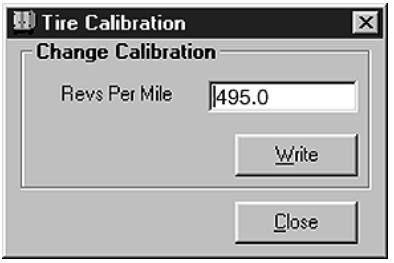
Service Information

Select ***Service Information*** to set, change or display the odometer reading for scheduled maintenance.

When the mileage setting selected for scheduled maintenance is reached, the ABS indicator lamp on the side of the trailer will flash eight times. The lamp will continue to flash eight times whenever the ignition switch is turned on, or until service is performed and this parameter is changed. To change the mileage for the next scheduled maintenance, type in the new odometer reading, then press the ***Write*** button. Maintenance settings may be entered in miles or kilometers.

Tire Calibration

Select ***Tire Calibration*** to set, change or display the revolutions per mile.



Tip: TOOLBOX™ will automatically change some numeric values; e.g., you may type in a number and see a number that is slightly higher or lower displayed. This does not affect calibration accuracy.

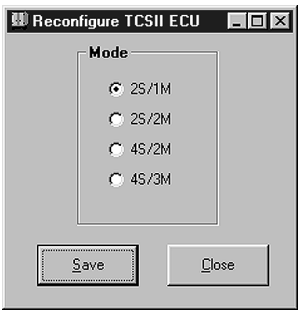
The RPM entry range is 150.0 to 634.0 RPM. The default value is 502.0. RPM figures are calculated based on a 100-tooth tone ring. To change a value, type in the RPM figure, then press the ***Write*** button.

- Trailers with 12-1/4-inch brakes use an 80-tooth tone ring. Use a value of 80 percent of the tire manufacturer's recommended RPM (revolutions x 0.80).

Reconfigure

This option is used to reconfigure an ECU that has been installed on a system with ***fewer*** sensors or modulator valves than the original system. It is not necessary to reconfigure an ECU installed on a system with ***more*** sensors or modulator valves than the original system. In these cases, reconfiguration is automatic.

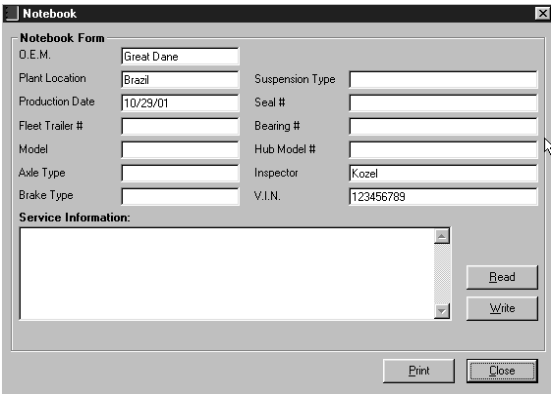
Select ***Reconfigure*** to display the following screen, then mark the appropriate configuration.



Notebook

Select ***Notebook*** to enter or view information about a specific vehicle.

NOTE: The O.E.M. location and production date are automatically saved in Notebook and will appear on this screen once they have been saved to the registry. V.I.N. and inspector must be saved after entering.

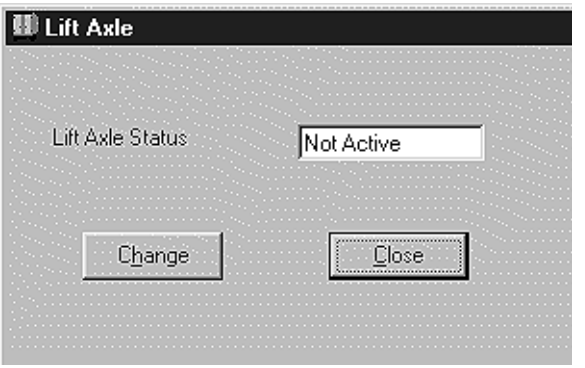


Tip: The registry function of Notebook is especially useful to an OEM.

To enter information, type the data, then click on the ***Write*** button to send the information to the ECU. Use the ***Print*** button to print the displayed data.

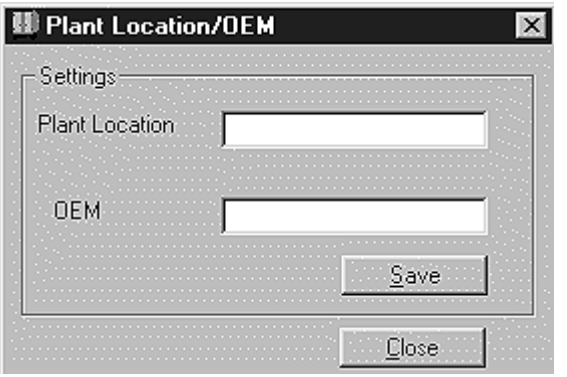
Lift Axle

Select ***Lift Axle*** to observe or change lift axle status.



Plant Location/ OEM

Select Plant Location/OEM to observe or enter plant and OEM information.

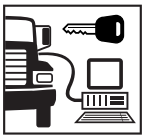


Hydraulic ABS

Reference Material

For maintenance and repair information, refer to the Meritor WABCO Trailer ABS Maintenance Manual:

MM-39 Hydraulic ABS for Medium-Duty Trucks, Buses and Motor Home Chassis

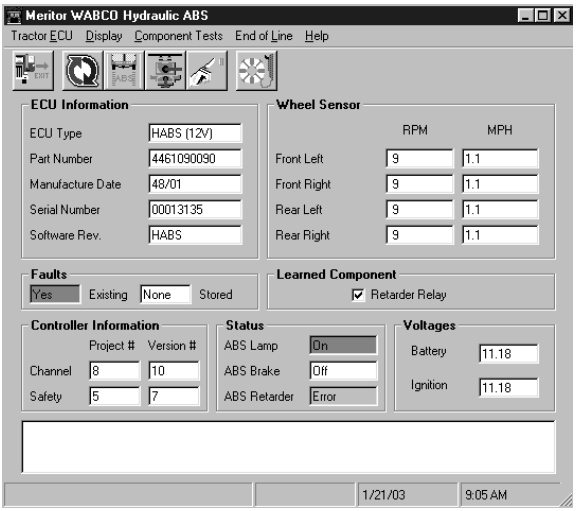


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

HYDRAULIC ABS MENUS AND TOOLBARS

Select Hydraulic ABS from the TOOLBOX™ ***Main Menu***. TOOLBOX™ will recognize the HABS or Hydraulic Power Brake (HPB) ECU and display the appropriate screen. If you are working with HPB, refer to the HPB section of this manual.

Main Screen



The ***Main Screen*** provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO HABS.

ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

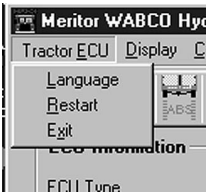
NOTE: Double click on Yes in the Existing or Stored Faults fields of the HABS ***Main Screen*** to bring up the Fault Information screen. Service Information may also be observed from this screen.

From the ***Main Screen***, you can select ***Restart, Exit*** or ***Help***.

Restart
Exit
Help

Tractor ECU

Select ***Tractor ECU*** from the HABS ***Main Screen***. A pull down menu will appear.



Language
Restart

Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

Exit

Select ***Exit*** to exit HABS and return to the TOOLBOX™ ***Main Menu***.

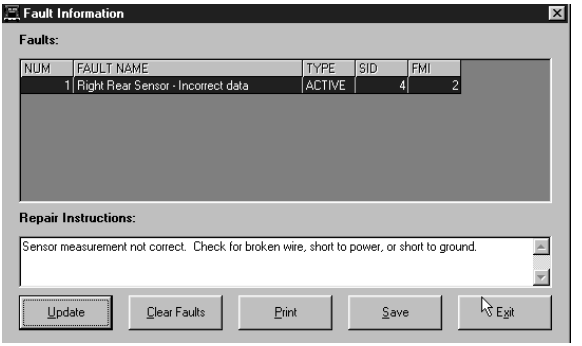
Display

Select ***Display*** from the HABS ***Main Screen***. A pull down menu will appear.

Faults

Select ***Faults*** to display the ***Fault Information*** screen.

NOTE: The ***Fault Information*** Screen is also accessible from the HABS ***Main Menu***.



The ***Fault Information*** screen contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

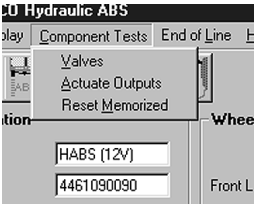
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for more information about Save and Print functions. Select ***Exit*** to close this screen.

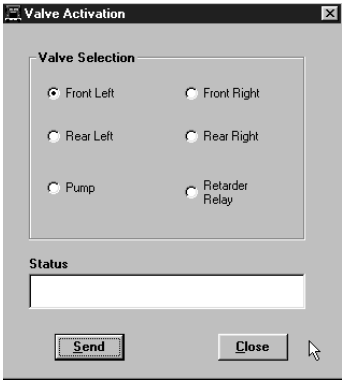
Component Tests

Select ***Component Tests*** from the HABS ***Main Screen***. A pull down menu will appear.



Valves

Select ***Valves*** to display the ***Valve Activation*** screen.

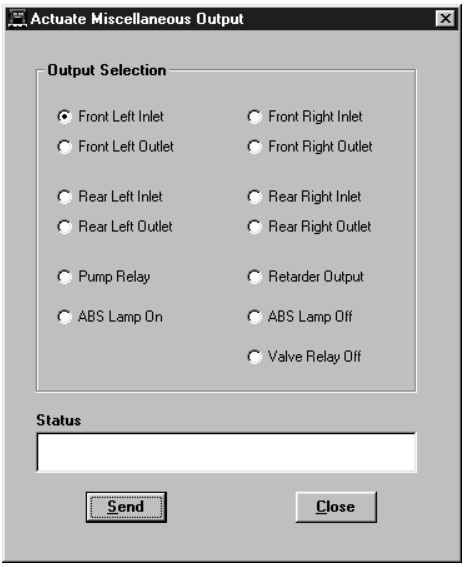


The ***Valve Activation*** screen lets you activate the four valves, the pump and the retarder relay. In addition to checking for correct activation, this screen provides an easy way to make sure the valves are wired correctly — and that wiring is not reversed.

Click on the valve, pump or retarder relay you wish to test, then click on the ***Send*** button to actuate the component. Component activation status appears in the ***status box*** field. Use the ***Close*** button to close this screen.

Actuate Outputs

Select ***Actuate Outputs*** to display the ***Actuate Miscellaneous Output*** screen.



This screen provides a check of the ABS indicator lamp. In addition, it provides a way to check either inlet or outlet activity of the valves, pump or retarder relay.

Click on the component you wish to test, then click on the ***Send*** button to actuate the component. Component activation status appears in the ***status box*** field. Use the ***Close*** button to close this screen.

Reset Memorized

Select ***Reset Memorized*** to display the ***Learned Component*** screen.

Relay is an automatic default and cannot be de-selected. It indicates the ECU has memorized the installed retarder relay. Once the ECU has seen a retarder, it expects to see it every time the vehicle is powered up.

Because there are times when an ECU is moved to another vehicle — or during diagnostic testing — you may want the ECU to disregard this learned component. Use the ***Reset Memorized*** command for this purpose.

End of Line

Tip: Have a copy of MM 39 or Installation Guide TP-99124 available BEFORE you perform a brake bleed. For your convenience, these publications are posted on meritorwabco.com.

The End of Line Brake Bleed Procedure is accessed from the HABS main screen. Use the Brake Bleed feature to bleed the expansion chambers. (See page 45.)

NOTE: Before connecting the vehicle to the computer, bleed the circuit and master cylinder. Follow the standard bleed procedures used by your facility, or use the procedures listed in Meritor WABCO HABS Installation Guide TP-99124 or HABS Maintenance Manual 39.

WARNING

Failure to bleed the system whenever any hydraulic system fitting is loosened or disconnected will allow air to remain in the system. This will prevent the hydraulic pressure in the brake system from rising enough to apply the brakes correctly. This will cause the stopping distance to increase and can result in serious personal injury.

Correctly discard hydraulic brake fluid that is removed from the brake system. Hydraulic brake fluid that is removed can be contaminated and can cause damage, loss of braking and serious personal injury.

Use only the type of hydraulic brake fluid specified by the equipment manufacturer. Do not use or mix different types of hydraulic brake fluid. The wrong hydraulic brake fluid will damage the rubber parts of the brake caliper and can cause damage, loss of braking and serious personal injury.

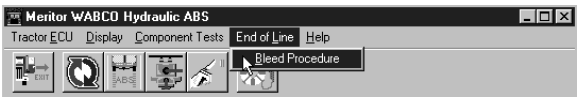
Do not let the brake master cylinder fluid get below the minimum level during the bleeding operation. Keep the master cylinder reservoir filled with new DOT-approved brake fluid, as specified by the original equipment manufacturer. Failure to keep the brake reservoir level above minimum could result in more air entering system, making it impossible to effectively bleed the system.

NOTE: Use DOT 3 or DOT 4 hydraulic brake fluid. Refer to the vehicle specifications to determine which fluid to use.

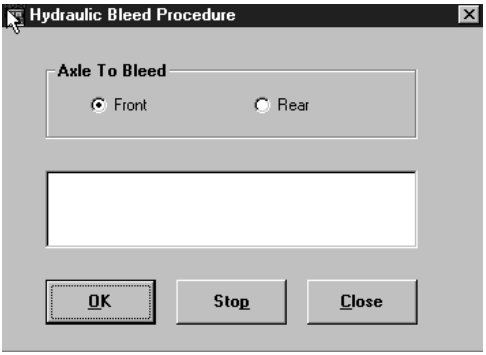
CAUTION

Hydraulic brake fluid is a caustic substance. Contact with hydraulic brake fluid can cause skin irritation. Do not let hydraulic brake fluid touch any painted surfaces, as it will remove the paint. Hydraulic brake fluid may also damage certain non-metal surfaces. Do not let fluid get on brake pads, shoes, rotors or disks.

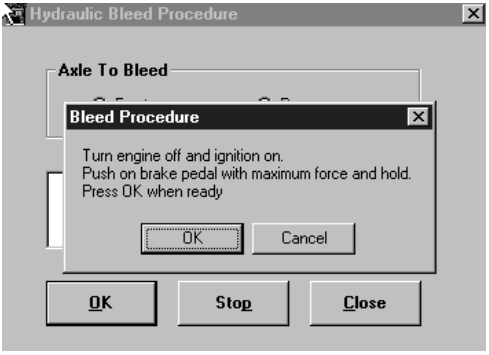
1. Apply the parking brake and block the tires. Turn the ignition off.
2. Perform brake bleed procedure for wet module, bleeding the circuit and master cylinder if required, prior to connecting laptop to truck.
3. Connect laptop to the vehicle using the J1587 diagnostic port in the cab of the truck.
4. Launch Meritor WABCO TOOLBOX™ Diagnostic Software.
5. From the ***Main Menu*** select the HABS icon.
6. Select ***End of Line*** from the ***HABS Main Menu***.
7. Select ***Bleed Procedure*** from the ***End of Line Menu***.



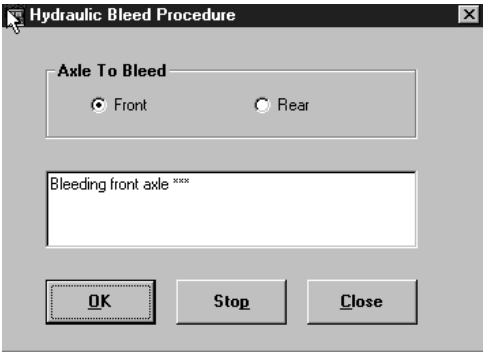
8. Choose axle to bleed from the select axle screen.



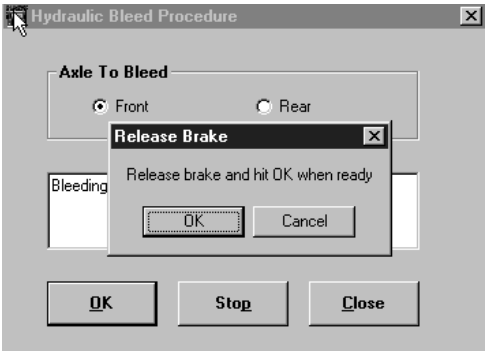
9. Follow on-screen prompts.



Click OK to continue.



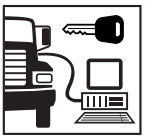
Click OK to continue.



10. Repeat procedure two additional times on this axle. This should eliminate all of the air in the chamber.
11. Perform manual bleed on this axle.
12. Repeat Steps 8-11 for the other axle.
13. Test drive the vehicle after bleeding the brakes.
    - If a firm brake pedal resistance is felt and the brake pedal pushes back when you perform an ABS stop, the system bleed procedure is complete.
    - If there is no firm pedal resistance, check the brake system for defects (leaks, etc.) and make the necessary repairs, then repeat the bleed procedure.

Hydraulic Power Brake (HPB)

Technical Assistance



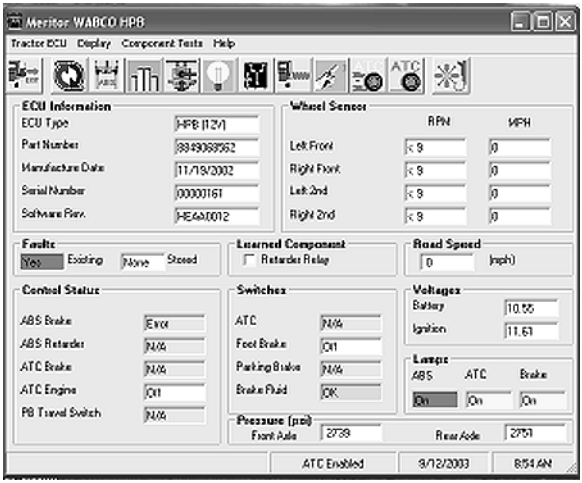
For technical assistance, please contact the ArvinMeritor Customer Service Center at 800-535-5560

NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

HYDRAULIC POWER BRAKE MENUS AND TOOLBARS

Select Hydraulic ABS from the TOOLBOX™ ***Main Menu***. TOOLBOX™ will sense the type of ECU being used and will display the ***HPB Main Screen***.

Main Screen

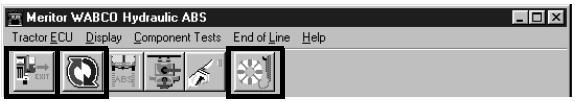


This screen provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO HPB.

ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

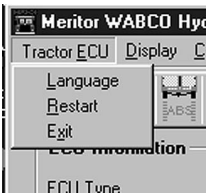
From the Main Screen you can select ***Restart***, ***Exit*** or ***Help***.

Restart
Exit
Help



Tractor ECU

Select ***Tractor ECU*** from the HPB ***Main Screen***. A pull down menu will appear.



Language

Refer to page 5 of this manual for information about using the Language selection.

Restart

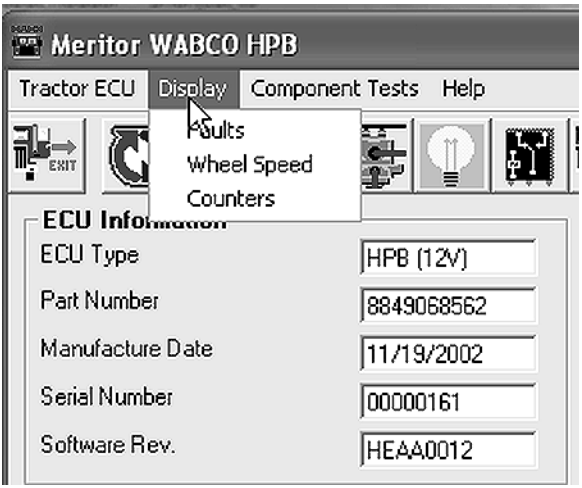
Select ***Restart*** to refresh (update) ECU information.

Exit

Select ***Exit*** to exit HPB and return to the TOOLBOX™ ***Main Menu***.

Display

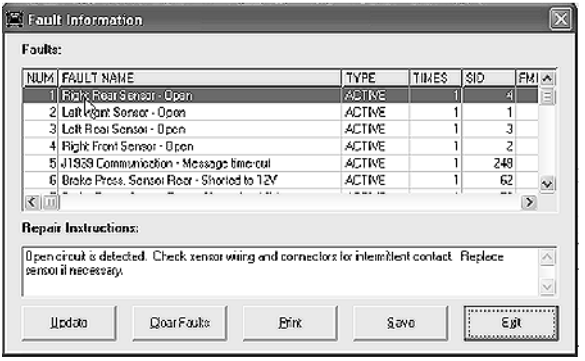
Select ***Display*** from the HPB ***Main Screen***. A pull down menu will appear.



Faults

Select ***Faults*** to display the ***Fault Information*** screen.

NOTE: The ***Fault Information*** screen is also accessible from the ***HPB Main Menu***.


Fault Information
Faults:
NUM
FAULT NAME
TYPE
TIMES
SID
FMI
1 Right Rear Sensor - Open ACTIVE 1 4
2 Left Front Sensor - Open ACTIVE 1 1
3 Left Rear Sensor - Open ACTIVE 1 3
4 Right Front Sensor - Open ACTIVE 1 2
5 J1939 Communication - Message timeout ACTIVE 1 248
6 Brake Press. Sensor Rear - Shorted to 12V ACTIVE 1 62
Repair Instructions:
Open circuit is detected. Check sensor wiring and connectors for intermittent contact. Replace sensor if necessary.
Update
Clear Faults
Print
Save
Exit

The ***Fault Information*** screen contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

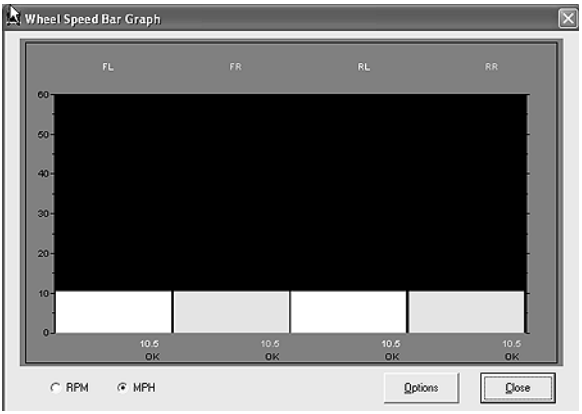
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for more information about Save and Print functions. Select ***Exit*** to close this section.

Wheel Speed

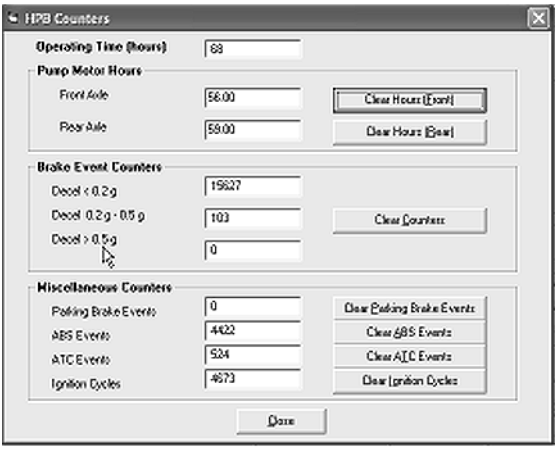
Select ***Wheel Speed*** to display the ***Wheel Speed*** screen.



Use the ***Wheel Speed*** screen to verify that sensors are connected at each wheel. Speed at a sensed wheel (FL, FR, RL, RR) indicates sensors are installed, but does not verify correct sensor installation.

Counters

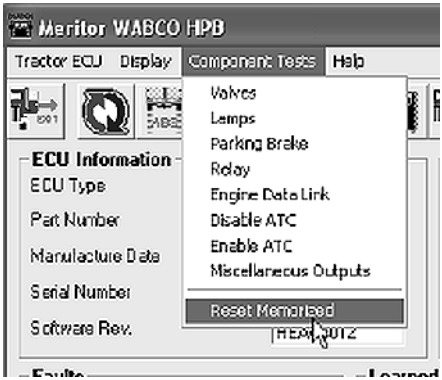
Select Counters to display the ***Counters*** screen.



The ***Counters*** screen provides an overview of HPB component performance (pump hours, brake events, etc.) as well as general vehicle activity such as ignition cycles. Occurrences displayed on this screen accumulate until the Clear button is selected.

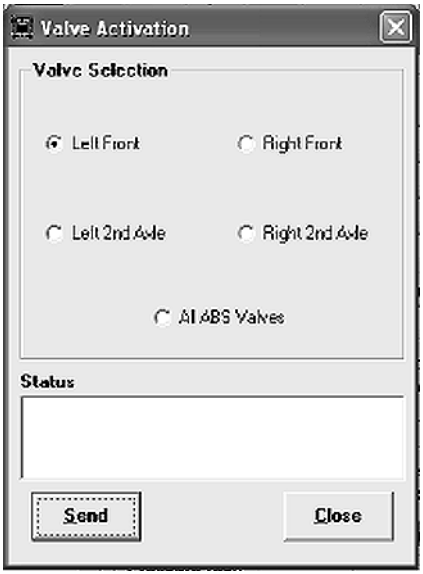
Component Tests

Select ***Component Tests*** from the HPB ***Main Screen***. A pull down menu will appear.



Valves

Select ***Valves*** to display the ***Valve Activation*** test screen.

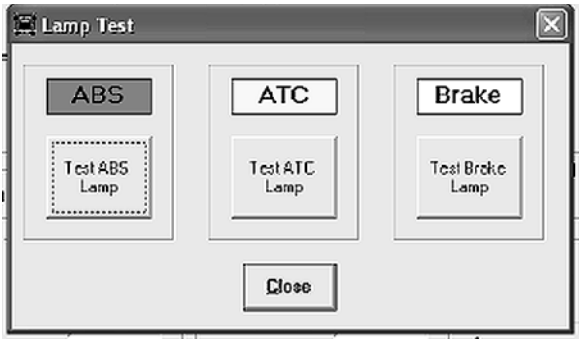


The Valve Activation test screen lets you activate the HPB valves and verify correct brake line installation.

Click on the valve you wish to test, then click the ***send*** button to actuate the component. Component activation status appears in the ***Status*** box field. Select ***Close*** to exit this screen.

Lamps

Select ***Lamps*** to display the ***Lamp Test*** screen.



As each lamp is tested, check the actual lamp to verify correct operation. Select ***Close*** to exit this screen.

WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

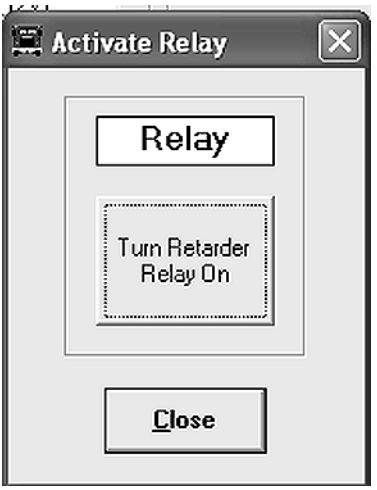
Parking Brake

Select ***Parking Brake*** to display the ***Parking Brake*** test screen.

Select ***Release*** or ***Apply,*** then select ***Send*** to test the parking brake. Select ***Close*** to exit this screen.

Relay

Select ***Relay*** to display the ***Activate Relay*** test screen.



This screen allows you to turn the Retarder Relay on or off. This is helpful in verifying correct operation, installation and wiring of the unit under test. Select ***Close*** to exit this screen.

Engine Data Link

Select Engine Data Link to display the ***Data Link*** test screen.

This screen allows you to send a "limit engine torque" command to the engine or a "disable retarder" command to the retarder.

Select the data link destination (engine or retarder), then select ***Send*** to test. Use the ***Stop*** button to end testing. Select ***Close*** to exit this screen.

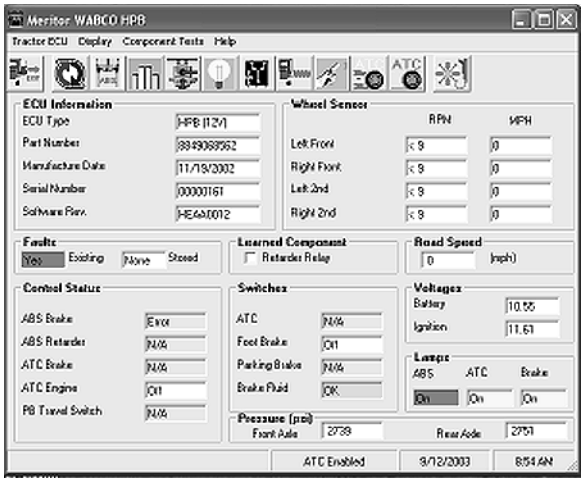
Disable ATC

Select Disable ATC to send a command to the ECU to disable automatic traction control. ATC will remain disabled until the enable command is sent, or until the vehicle ignition is cycled. ATC must be disabled for ATC testing.

Enable ATC

Select Enable ATC to send a command to the ECU to enable automatic traction control. This is the normal state of the ECU.

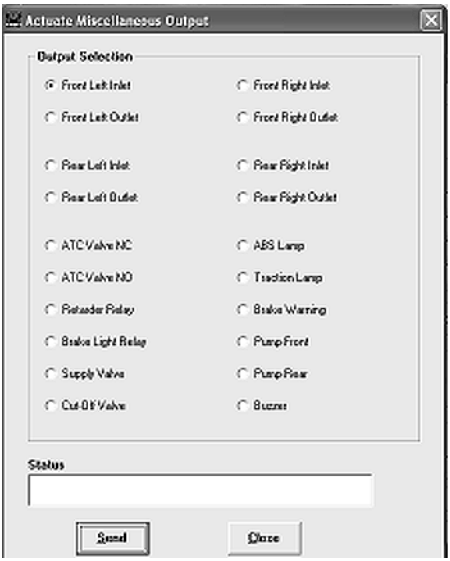
NOTE: The status bar on the HPB Main Menu reflects the current ATC status (enabled, disabled or not available).



Miscellaneous Outputs

Select Miscellaneous Outputs to display the Activate Miscellaneous Outputs test screen.

NOTE: Use TOOLBOX™ to test the following components: **Retarder Relay, Brake Light Relay, Supply Valve, Cut-Off Valve, ABS Lamp, Traction Lamp, Brake Warning, Pump Front, Pump Rear, Buzzer.**



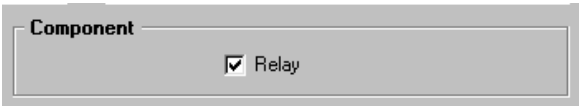
This screen provides a check of several HPB components, as well as a way to check either inlet or outlet activity of the valves, pump or retarder relay.

Highlight the component you wish to test, then select the ***Send*** button to actuate the component. Component activation status appears in the ***Status Box*** field. Select ***Close*** to exit this screen.

Reset Memorized

(For Systems Equipped with a Retarder Relay)

Select ***Reset Memorized*** to display the ***Learned Component*** screen.



Relay is an automatic default and cannot be de-selected. It indicates the ECU has memorized the installed retarder relay. Once the ECU has seen a retarder, it expects to see it every time the vehicle is powered up.

Electronic Leveling Module (ELM) for Tractors

Reference Material

For Maintenance and Repair information, refer to Meritor WABCO ELM Service Bulletin number TP0324. A copy of this bulletin is posted on our website, www.meritorwabco.com.

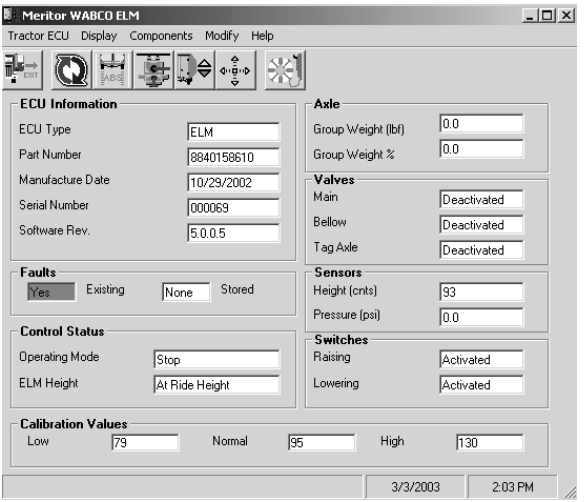
Computer to Vehicle

NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be on in order to display information.

ELM ABS MENUS AND TOOLBARS

Select ***Tractor ELM*** from the TOOLBOX™ ***Main Menu***. The ELM ***Main Screen*** will appear.

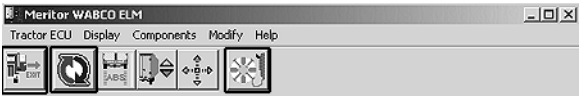
Main Screen



This screen provides icons and pull down menu task selections. It also provides information about the current state of the Meritor WABCO ELM. ECU information (e.g., part number, serial number, etc.) is read once and does not change. All other information, such as wheel sensor speed and voltages, is read and updated continuously.

Restart
Exit
Help

From the ***Main Screen*** you can select ***Restart***, ***Exit*** or ***Help***.



ELM

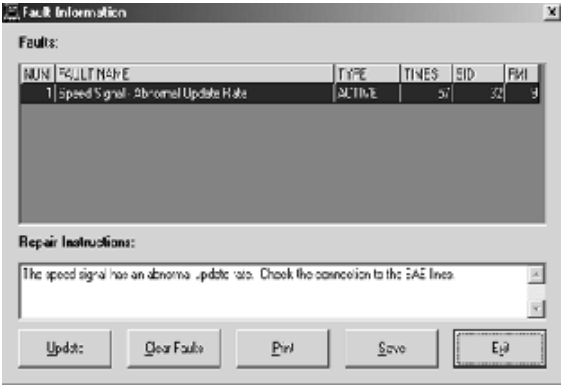
Select ***ELM*** from the ELM ***Main Screen***. A pull down menu will appear with English listed. This program is available in English only.

Display

Select Display from the ELM ***Main Screen***. A pull down menu will appear.

Faults

Select faults from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Repair instructions for each fault are also provided.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button to refresh the fault information table.

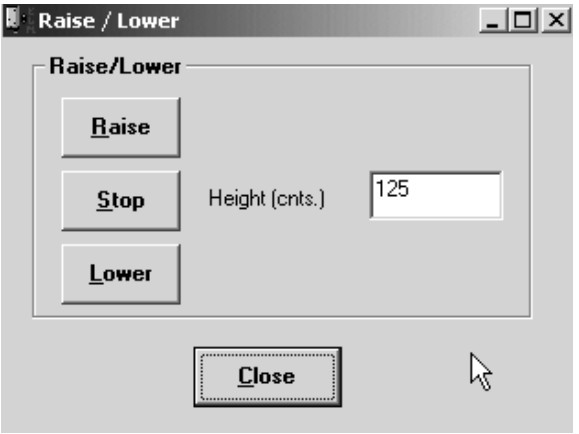
After making the necessary repairs, use the ***Clear Faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

Use the ***Save*** or ***Print*** button to save or print the fault information data.

Components

Select ***Component Tests*** from the ELM ***Main Screen***. A pull down menu will appear.

Select R***aise/Lower*** to raise or lower the chassis. The ***Raise/Lower*** screen will appear.



Select ***Raise*** to raise the vehicle chassis to the ride height or ***Lower*** to lower the vehicle chassis to the ride height low level.

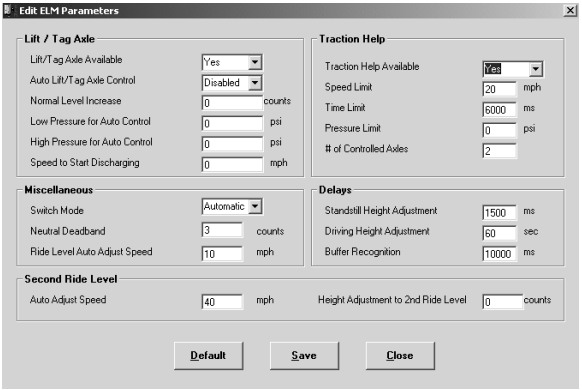
Select ***Stop*** to halt the raising or lowering. The height of the vehicle chassis during raising or lowering is displayed on the screen in the ***Height*** field. Note that the measurement is in centimeters.

Select ***Close*** to return to the ***ELM Main Menu***.

Modify

CAUTION:
Do not modify ELM parameters unless instructed to do so by the fleet or terminal manager.

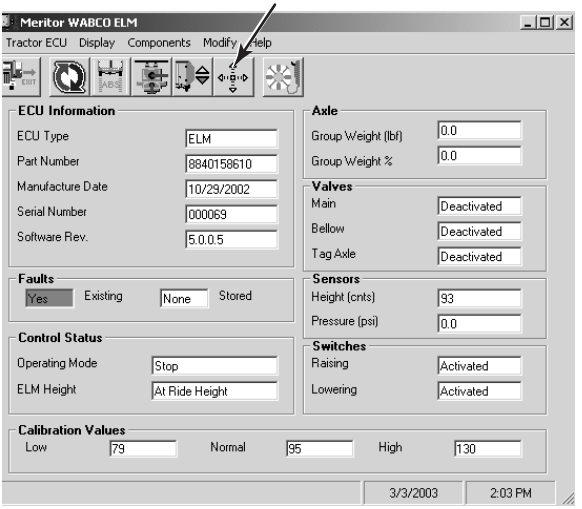
Select Modify from the ELM ***Main Screen***. The ***Edit ELM Parameters*** screen will appear.



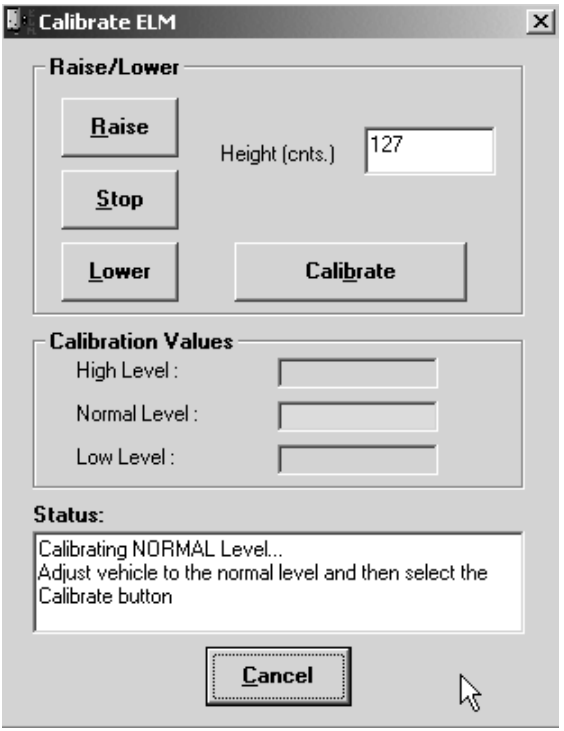
Calibrate

At the ***ELM Main Menu*** click on the ***Calibration*** icon.

CALIBRATION ICON



Select ***Start Calibration***. The ***Calibrate ELM*** screen will appear.



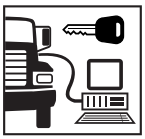
- Follow the on-screen prompts to raise and lower the vehicle to the normal ride height selected by the vehicle manufacturer. Press ***Calibrate*** to set.
- After ride height is set, raise the vehicle to the upper level. Press ***Calibrate*** to set.
- After upper level is set, lower the vehicle to the low level. Press ***Calibrate*** to set.
- Check the screen to verify that the calibration was successful.

Electronic Leveling Module (ELM) for Trailers

Reference Material

For Maintenance and Repair information, refer to Meritor WABCO ELM Service Bulletin number TP0326. A copy of this bulletin is posted on our website, www.meritorwabco.com.

Computer to Vehicle



NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

ELM ABS MENUS AND TOOLBARS

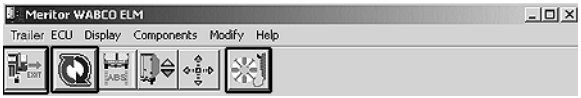
Select ***Trailer ELM*** from the TOOLBOX™ ***Main Menu***. The ELM ***Main Screen*** will appear.

Main Screen

This screen provides icons and pull down menu task selections. It also provides information about the current state of the Meritor WABCO ELM. ECU information (e.g., part number, serial number, etc.) is read once and does not change. All other information, such as wheel sensor speed and voltages, is read and updated continuously.

Restart
Exit
Help

From the ***Main Screen*** you can select ***Restart***, ***Exit*** or ***Help***.



ELM

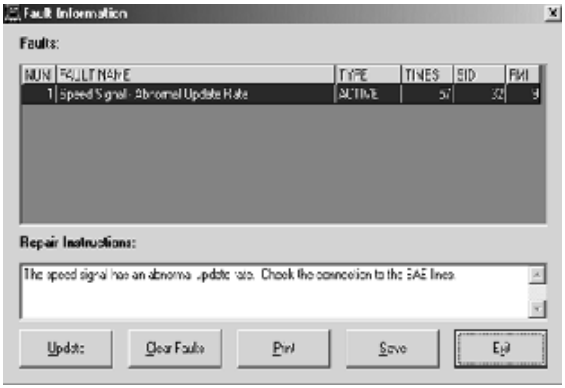
Select ***ELM*** from the ELM ***Main Screen***. A pull down menu will appear with English listed. This program is available in English only.

Display

Select Display from the ELM ***Main Screen***. A pull down menu will appear.

Faults

Select faults from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Repair instructions for each fault are also provided.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button to refresh the fault information table.

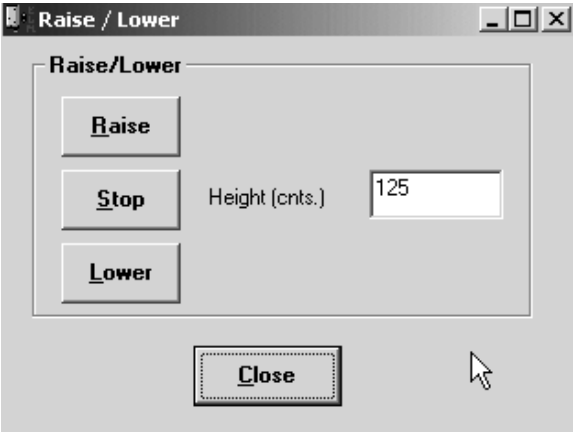
After making the necessary repairs, use the ***Clear Faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

Use the ***Save*** or ***Print*** button to save or print the fault information data.

Components

Select Components from the ELM ***Main Screen***. A pull down menu will appear.

Select ***Raise/Lower*** to raise or lower the chassis. The ***Raise/Lower*** screen will appear.



Select ***Raise*** to raise the vehicle chassis to the ride height or ***Lower*** to lower the vehicle chassis to the ride height low level.

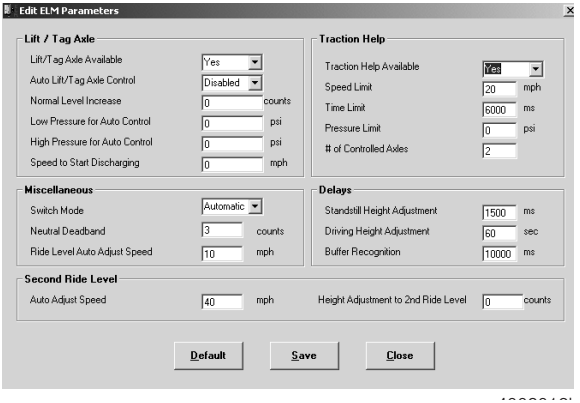
Select ***Stop*** to halt the raising or lowering. The height of the vehicle chassis during raising or lowering is displayed on the screen in the ***Height*** field. Note that the measurement is in centimeters.

Select ***Close*** to return to the ***ELM Main Menu***.

Modify

CAUTION:
Do not modify ELM parameters unless instructed to do so by the fleet or terminal manager.

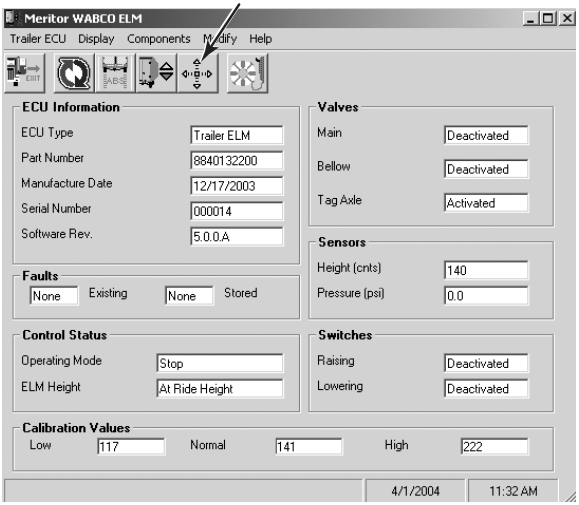
Select Modify from the ELM ***Main Screen***. The **Edit ELM Parameters** screen will appear.



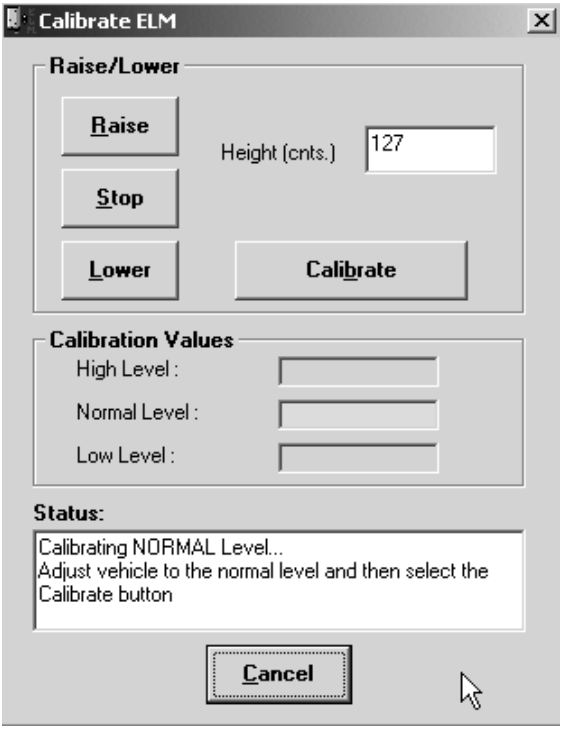
Calibrate

At the ***ELM Main Menu***, click on the ***Calibration*** icon.

CALIBRATION ICON



Select ***Start Calibration***. The ***Calibrate ELM screen*** will appear.



- Follow the on-screen prompts to raise and lower the vehicle to the normal ride height selected by the vehicle manufacturer. Press ***Calibrate*** to set.
- After ride height is set, raise the vehicle to the upper level. Press ***Calibrate*** to set.
- After upper level is set, lower the vehicle to the low level. Press ***Calibrate*** to set.
- Check the screen to verify that the calibration was successful.

Appendix

Device Select Information

Before using TOOLBOX™ Software for the first time, you must indicate which COM port and adapter box will be used. If you have questions about Com Ports, Adapter Boxes or Drivers, the following information will answer many of your questions. Please review this material before you select the COM port and device. If you need further clarification, please contact the ArvinMeritor Customer Service Center at 1-800-535-5560.

Communication Drivers

Communication drivers are software programs that control the passing of data between the PC and the vehicle. Messages are sent and received via the PC's Com port and an adapter box.

Noregon communication drivers are included with the TOOLBOX™ installation CD. These drivers are RP1210A compliant and work with most adapter boxes (refer to adapter boxes). Some adapter boxes (i.e., MPSI MagiKey and Dearborn) require communication drivers other than Noregon. These drivers must be procured from the manufacturer and installed separately.

Adapter Box

An adapter box is an electronic device that connects the PC's COM port to the vehicle's diagnostic connector. It converts the computer's voltages to the levels used in the truck.

Selecting an Adapter Box in TOOLBOX™

To communicate correctly with the vehicle, TOOLBOX™ needs to know which adapter box is being used. To select an adapter box, run TOOLBOX™. Go to the ***System Setup*** menu and select ***COM Port*** from the pull down menu. All of the installed communication drivers with be displayed on the ***Vendor*** listing.

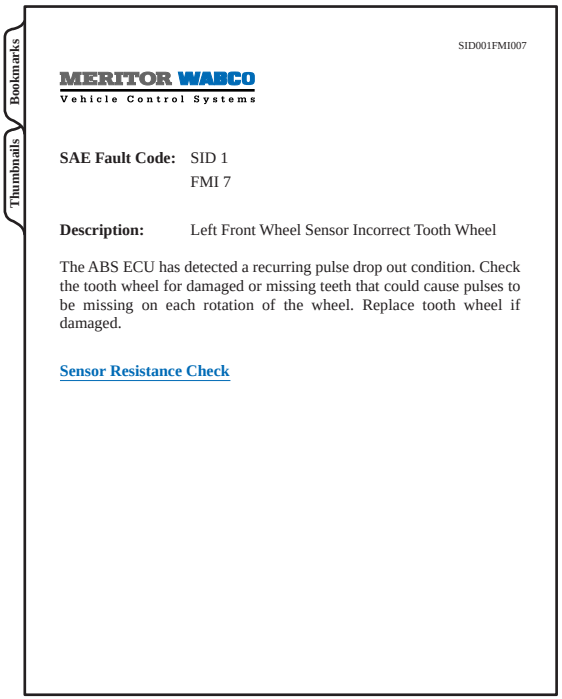
Once a vendor has been selected, the ***Protocol*** and ***Device*** lists will be updated, and the adapter can then be selected under ***Devices***.

Connecting the Adapter Box

Most adapter boxes require two cables, one that connects the PC to the adapter box and a second that connects the adapter box to the vehicle. The first cable is usually connected to the serial (COM) port on the PC, but in the case of the MPSI Parallel Data Module, the connection is made to the parallel (printer) port. The second cable goes to the diagnostic connector located in the vehicle.

Fault Information Sheet

This is an example of a Fault Information Sheet. These sheets are available in version 5.0 for Tractor ABS, Trailer ABS and Hydraulic ABS.


Bookmarks
Thumbnails
SID001FMI007
MERITOR WABCO
Vehicle Control Systems
SAE Fault Code: SID 1
FMI 7
Description: Left Front Wheel Sensor Incorrect Tooth Wheel
The ABS ECU has detected a recurring pulse drop out condition. Check the tooth wheel for damaged or missing teeth that could cause pulses to be missing on each rotation of the wheel. Replace tooth wheel if damaged.
Sensor Resistance Check

TOOLBOX™ Technical Support

For technical assistance, contact the ArvinMeritor Customer Service Center at 800-535-5560. Or, visit the Meritor WABCO website at www.meritorwabco.com and use the Contact Us feature to email your request to a customer service representative.

To expedite your request, you should be prepared to provide the following information.

- TOOLBOX™ Software Version Number. To find the version number:

  Open TOOLBOX™.

  Click on Help, then on About PC Diagnostics.

  The version number will appear on the screen.
- ECU Type
- ABS Tractor: Basic, Universal or Frame
- ABS Trailer:

  Look at the ECU field on the ABS Tractor Main Screen. If ECU type is not listed, refer to the vehicle specification sheet for this information.

Electronic Leveling Module (ELM)

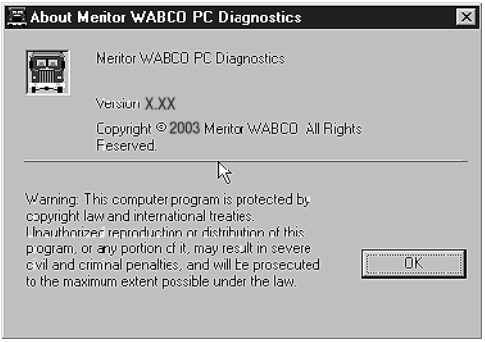
System Information

(Versions 5.0 and Higher)

Select ***System Information*** and follow the screen prompts to print a report of system hardware: operating system version, drivers, etc. Run this report whenever you contact the ArvinMeritor Customer Service Center.

About

Select ***About*** from the pull down menu for information about Meritor WABCO TOOLBOX™ Software, including the version number. You may need this information if you call the ArvinMeritor Customer Service Center.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Version X.XX
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OK

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For more information, call **800-535-5560**.

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TOOLBOX™ Software
User's Manual
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